

ORIENTEERING

LESSON 1: ORIENTEERING

PURPOSE

This lesson will introduce you to orienteering, its techniques and terminology, as well as the various types of orienteering courses. In addition, many of the map reading and land navigation skills practiced in previous lessons will be applied.



*Aiming Off
Attack Point
Control Points
Orienteering
Steering Mark*

INTRODUCTION

Orienteering began in Scandinavia in the 1800s, primarily as a military event and as part of military training. By 1919 it had become a competitive sport in Sweden. Then in the early 1930s, the sport received a boost with the invention of an improved compass. Bjorn Kjellstrom, one of the inventors of that compass, introduced orienteering to the U. S. in 1946.

Orienteering is for all ages and degrees of fitness and skill. It provides the suspense and excitement of a treasure hunt. The object is to locate **control points** (see Illustration 3.1.1) by using a map and compass to navigate the terrain.



Illustration 3.1.1

Organizers of an orienteering event will give each participant a topographic map with various control points circled. Each control point has a corresponding flag marker on the ground and a special punch which organizers use to mark the scorecard. Competitive orienteering involves running from point to point. It is more demanding than road running, not only because of the terrain, but because the participant must make decisions, and keep track of the distances covered. Courses may be as long as 10 kilometers.

Although orienteering challenges both the mind and the body, the competitor's ability to think under pressure and make wise decisions is sometimes more important than speed or endurance. The person just starting out in orienteering should concentrate more on refining map reading and land navigation skills than on running between the control points.

TYPES OF ORIENTEERING COURSES

There are different types of orienteering events that range from individual courses, to a relay event, to night competition. All types of orienteering courses are interesting and challenging, but they vary in their degree of difficulty. The best location for an orienteering course is one that is easily identifiable on both a map and the actual terrain. It should also be accessible from several routes. Listed below are some of the most common orienteering events/courses.

ROUTE ORIENTEERING

This form of orienteering can be used by beginners to the sport as well as for advanced competition. In route orienteering, a master (or advanced competitor) walks a route while beginners trace the actual route walked

on the ground using their maps. Beginners circle the location of the different control points found along the walked route. When they finish, organizers analyze and compare the maps. For beginners, time is not a factor in this event.

Another variation of route orienteering involves a course laid out with markers for the competitor to follow. Because the route is indicated with flags or markers, there is no master map. The winner of the event is the competitor who successfully traces the route and accurately plots the most control points.

LINE ORIENTEERING

In line orienteering, competitors trace on their maps a pre-selected route from a master map that has at least five control points. The object is to walk the route shown on the map, circling the control points on the map as competitors locate them on the ground. See Illustration 3.1.2.

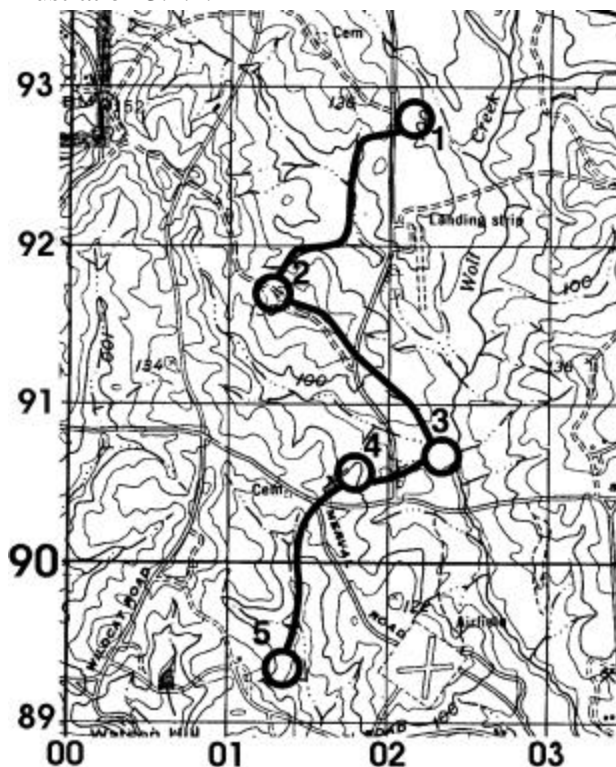


Illustration 3.1.2

CROSS-COUNTRY ORIENTEERING

Cross-country (or free-point orienteering) is the most common type of orienteering competition. It is considered to be the most competitive and intriguing form of orienteering. In this event, all competitors must visit the same control points in the same order. With the normal one-minute starting interval, it becomes a contest of route choice and physical skill. The competitor with the fastest time is the winner.

The length and difficulty of the course is determined by the skill of the competitors. There are usually six to 12 control markers on the course in varying degrees of difficulty and distances apart so that there are no easy, direct routes. The course may be closed-in with the start and finish located at the same position (see Illustration 3.1.3) or the start and finish may be at different locations.

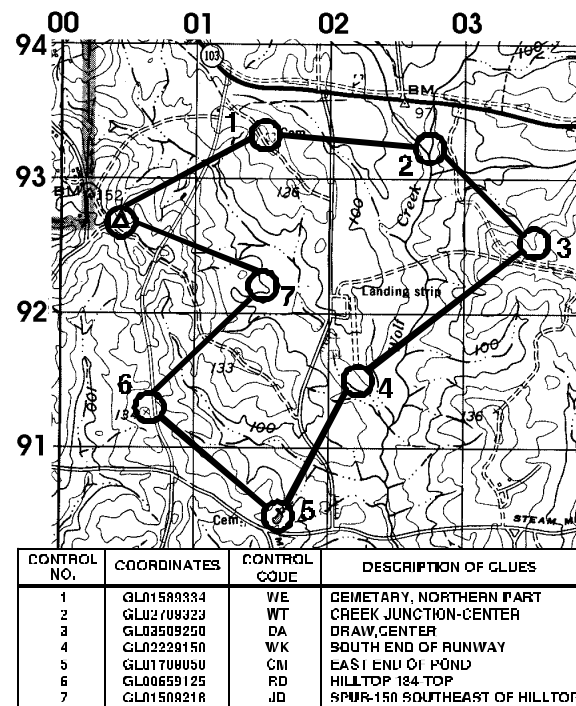


Illustration 3.1.3

Organizers mark each point in order on a master map. They give competitors a clue list that describes each control point with an 8-digit grid coordinate, a two-letter control code, and a clue describing the terrain in the location of the marker. Competitors must indicate on their score cards proof of visiting each control marker. This is usually done with a special stamp or punch.

SCORE ORIENTEERING

In this event, the area chosen for the competition has many control points. The control points near the start/finish point (usually identical in this event) have a low point value, while those more distant or more difficult to locate have a high point value. The competitor must locate as many control markers as possible within the specified time (usually 90 minutes).

As with a cross-country event, organizers give each competitor a map and an event card. The card lists all the control points with their different values.

Organizers design the course (see Illustration 3.1.4) so that there are more control points than a competitor can possibly visit in the allotted time. Therefore, competitors must plan and choose their route between control points carefully. Points are awarded for each control point visited and deducted for exceeding the specified time. However, there is no reward for returning early with time still available to find more points. Therefore, the good competitor must be able to coordinate time and distance with the ability to land navigate while running the course. The competitor with the highest point score is the winner.

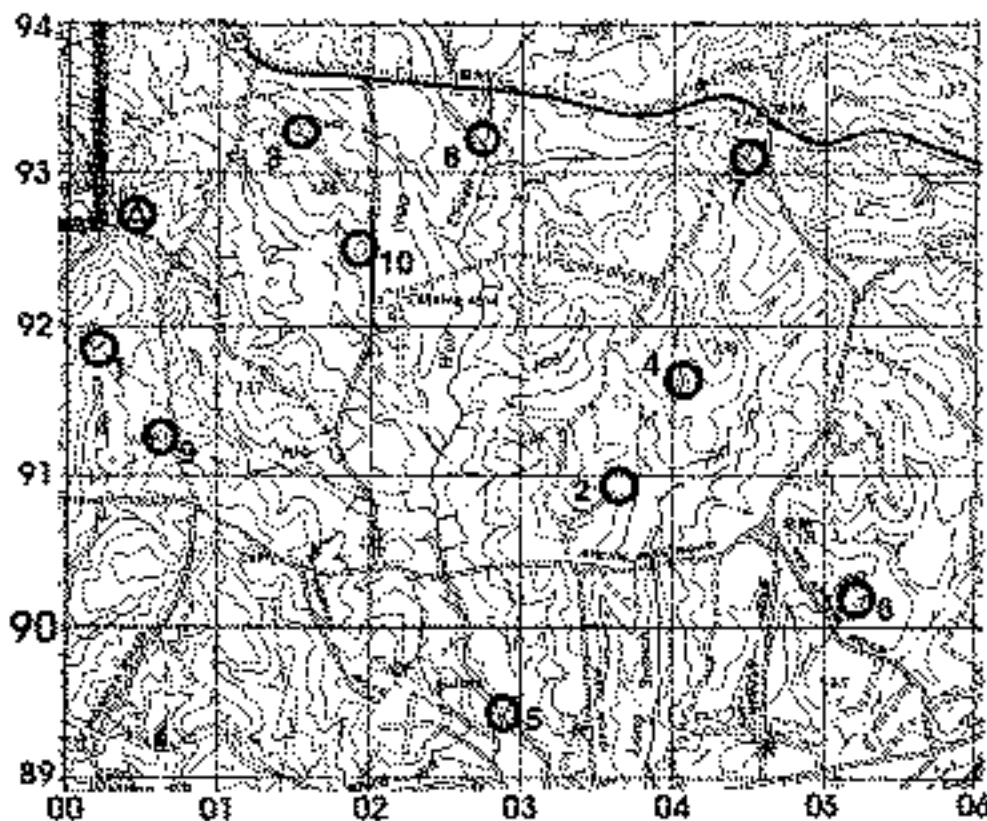


Illustration 3.1.4

RELAY ORIENTEERING

This type of orienteering is a popular team sport. Each member of the team runs a free-point or line orienteering leg of one to two miles. No person runs more than one leg. The competition may be held using a master map for the entire course or one for each leg.

In the case of a master map for the entire course, the first team member copies down all legs of the course. After completing the first leg, he or she hands the map to the next runner, who completes the next leg of the course. The team repeats this process until all members have run their portion of the course.

In the case of a master map for each leg, the first trainee goes to a master map that has only the first location on it. When that person completes the first leg, he or she gives the map to the next person, who goes to a different master map and copies the second portion of the course. This continues until all members of the team have completed their legs.

NIGHT ORIENTEERING

Night orienteering is a free-point or score event occurring in the evening. The main differences between a night conducted free-point or score and one conducted during the day are:

- Control points are marked by a light that is visible from 30 to 50 meters in all directions.
- Control points are located no more than 400 to 800 meters apart.
- The event is run over less difficult terrain.
- Competitors receive a detailed safety briefing before the event begins.

- The signal used to indicate the conclusion of the event or an emergency is a vehicle horn or a flare.

CONTROLLING YOUR MOVEMENT

DETERMINING DIRECTION OF TRAVEL

Once you have plotted the course's control points, you must determine how to get to the first and other control points. The basic compass technique used in orienteering to determine direction of travel consists of five steps:

- Step 1. Lay the map on a flat surface and orient it to magnetic north by placing the edge of the compass along a north-south grid line. Rotate the map and compass until the north arrow is under the black hairline.
- Step 2. Keeping the map oriented, move the compass in such a way that one side of the compass touches your location and your destination. The compass is now pointing in the direction of travel.
- Step 3. Rotate the bezel ring until the luminous line is pointing to grid north on the map. The luminous line should be over the north arrow (if the map is still oriented) and it should be parallel to the north-south grid line.
- Step 4. Lift the compass off the map and correct for magnetic declination. If the declination is west, rotate the bezel ring counterclockwise; if east, then rotate it clockwise.
- Step 5. Holding the compass in front of you, rotate your body until the north arrow lies under the luminous line. The direction of travel is now indicated by the black hairline.

ROUTE SELECTION

As mentioned at the beginning of this chapter, orienteering develops many skills besides map reading. An important one is decision-making. Route selection is where competitors must make decisions. Which is the fastest way from point A to point B? Is it over or around a hill? Is it going cross country or using a road or trail? Except for those instances when organizers mark or specify the route in advance, wise route selection is important.

A good orienteering course will have some elevation obstacles. These obstacles will force you to decide if it is faster to go the most direct route over it or to take a longer detour around it. A simple formula to convert height into comparable flat distance is: *25 feet of elevation equals 100 meters on a flat surface*. For example, suppose the straight line distance to point B is 500 meters with a 50 foot high hill en route. The energy you would expend would be equivalent to running 500 meters plus an additional 200 meters for going over the hill. If the detour around the hill equals a total of 680 meters, it may be easier to go around it, depending upon the type of terrain you encounter.

The type of terrain and vegetation that you encounter has a major impact on your pace. You must know your pace count through several types of terrain. In addition, you must know your pace when trotting and running, both when you are fresh and when you are tired. Although pacing will vary from individual to individual, Illustration 3.1.5 may be useful to a beginner. These figures apply during daylight, when the runner is fresh and on flat terrain. The numbers represent paces or each time the left foot strikes the ground.

	SMALL	MEDIUM	TALL
	(less than 5' 8")		(over 6' tall)
Road/Path	42	40	47
Light Vegetation	45	43	40
Open Forest	50	46	43
Dense Forest	55	50	46

Illustration 3.1.5

MOVEMENT TECHNIQUES

In addition to knowing where the control points are and where you are at all times, you must also know the best route for getting to the next control point. The shortest route may not be the fastest, and it may not pay to travel between two points as fast as possible if you tire yourself out in the process. Remember, you can locate your position on a map using terrain features, a back azimuth, or resection.

There are several techniques available to aid you in moving from one control point to another. They include the following:

- **Direct line.** This method involves establishing a compass bearing between your location and the destination. Then, follow the compass bearing until you reach the point. A variation of this technique is to establish a compass bearing that you will follow for a specific distance at which time you establish a new bearing. Repeat this process until you reach the final destination.
- **Steering marks.** A steering mark is a prominent object or terrain feature on the ground that you can see and that is in the general direction of travel. Such objects as a lone tree or building are good examples of steering marks. One of the advantages of this technique is that once you reach the

steering mark, you can reorient yourself before continuing.

- **Aiming off.** This technique is valuable when your destination lies along a linear terrain feature such as a road or stream. Due to errors in compass or map reading, you may reach a linear feature and not know whether your objective lies to the right or the left. Furthermore, each degree that you are offset to the right or left will move the aim-off point from the destination 17 meters to the right or left for each 100 meters traveled. For example, if the number of degrees offset is 10 and the distance traveled is 100 meters, then your location is 170 meters to the left of the objective ($10 \text{ degrees offset} \times 17 \text{ meters per } 100 \text{ meters traveled} = 170$).

A proven technique to prevent this from occurring is to deliberately aim to one side of the destination. Then, when you reach the linear feature, you will know in which direction to turn.

- **Attack points.** When using this technique, you select a prominent terrain feature, such as a hilltop or road junction, near your destination. You may use any technique to arrive at this point. Once there, you can reorient yourself, and then make a final short approach to it. The purpose of this technique is to minimize the distance you have to travel on the final approach. This in turn limits any errors in compass work or pacing you might make in locating the destination. The difference between an attack point and a steering mark is that you select an attack point from a map.
- **Geographic orientation.** This technique involves keeping the map oriented as you travel and remembering what terrain features you will encounter en route to the next control point. For example, if you decide to follow a road to reach the next

control point, you should orient the map as you stop and make turns along the road.

Using Illustration 3.1.6, assume that you wish to travel from your position at “A” to control point 4. One route that you could take would be to use the north-south intermittent stream bed. Pass the first two east-west intermittent stream junctions that you encounter and take the eastern fork at the third junction. Follow that intermittent stream and draw to the road junction (which you can call an attack point). From the road junction, shoot an azimuth of 77 degrees to the control point.

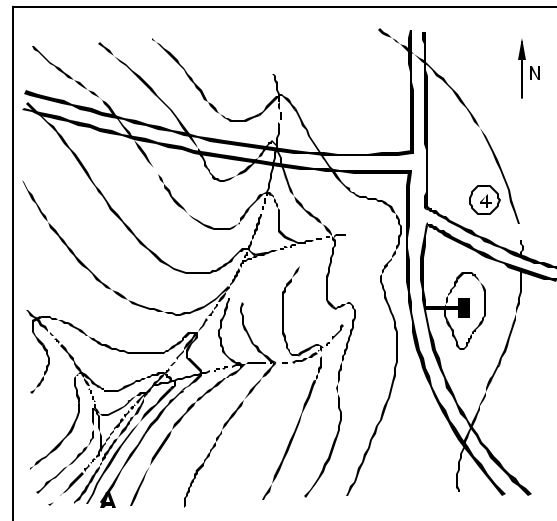


Illustration 3.1.6

CLOTHING AND EQUIPMENT

When planning to participate in an orienteering event, you should wear and take the proper clothing and equipment.

Choose the *clothing* to wear depending on the type of vegetation and terrain you will encounter on the course. For example, in bushy terrain, you should wear a long-sleeve shirt and long pants to protect against cuts and scratches. For those who want to pursue orienteering as a sport, consider purchasing light nylon racing suits. These are full-length suits (usually fluor-

escent) with long sleeves and pouches in the front to carry maps, compasses, etc.

Hiking *shoes* or boots are excellent for orienteering because of their durability and the ankle support they provide. High-top sneakers also provide excellent ankle support. Cross-country running shoes are good because they are lightweight and have better traction in mud, but they do not normally support the ankles.

Although a standard military lensatic compass is very good for orienteering, its one disadvantage is the time required for the needle to stabilize prior to lining up an azimuth. Those who desire to pursue orienteering as a sport may want to acquire an induction dampened or liquid-filled compass.

The *map* is probably the most important item the participant carries. The most common map used in orienteering is a topographic map with a 1:50,000 scale; however, competitors prefer a 1:25,000 scale because it is easier to read and it shows features in greater detail. Try to use multi-colored maps if they are available. Once a competitor outlines the course details and copies the key terrain features from color-coded master maps, his/her own maps, should be covered with a clear, plastic-like material such as a document protector to prevent these marks from smearing and/or becoming unreadable.

ORGANIZATION OF THE COURSE

OFFICIALS

Most events often use the same officials at both the start and finish. They include:

At the Start

- Course Organizer. Briefs competitors in the assembly area, issues event cards and maps, and calls competitors forward to start individually (or in groups if it is a group event).

- Recorder. Records the competitor's name and start time on recorder's sheet, checks the competitor's name and start number on the event card, and issues any last-minute instructions.
- Timer. Controls the master clock and releases the competitors across the start line at their start time (usually at one-minute intervals) to the master map area.

At the Finish

- Timer. Records the finish time of each competitor on his or her event card and passes the card to the recorder.
- Recorder. Records competitor's finish times on the recorder's sheet and tallies final score based on time and correctness of control points visited.
- Course Organizer. Verifies correctness of names, finish times, and final score. Posts competitors' positions on a results board and accounts for all participants at the end of the event.

More officials and/or assistants may be used. However, the three listed above are the minimum required to run the competition.

CONTROL AREAS

In many orienteering events, there are three or four control areas. They are:

- *Assembly Area*. Here participants register and receive instructions, maps, event cards, and start numbers. They may also change into their orienteering clothes if facilities are available, study their maps, and fill out their event cards. Sanitation facilities are normally available in this area.

- *Start (Start/Finish).* At the start, each competitor reports to the recorder and timer to be logged in and released. Oftentimes, the start and finish are at the same location.
- *Master Map Area.* There are three to five master maps 20 to 50 meters from the start. When the participants arrive at this area, they must mark all the course's control points on their maps. Having done this, competitors must decide on the route they will follow. Experienced competitors will take the time to orient their map and carefully plot the route before rushing off.

CONTROL CARDS

- *Event Card.* Organizers make the event card as small as possible so that competitors can easily carry it in a pocket. It contains the following items: name, start number, start time, finish time, total time, place, and spaces for marking the control points visited. As indicated earlier, it may also contain a listing of descriptive clues. Illustration 3.1.7 is a sample event card for the most common type of an orienteering course.

CROSS COUNTRY ORIENTEERING	
NAME _____	COMPANY _____
COURSE _____	START TIME _____
FINISH TIME _____	
CONTROL POINTS	DESCRIPTION CLUES
1 _____ 2 _____	<p>SAMPLE FORMAT</p> <p>NOTE: All control signs are located at eye level on trees.</p>
3 _____ 4 _____	
5 _____ 6 _____	
Total Value of Points _____	1. All work is individual team effort.
Penalty Points _____	2. You must not join with or coordinate with any other team.
Final Score _____	3. You must personally visit each point you indicate on your score card.

Illustration 3.1.7

- *Clue Description Card.* Organizers prepare these cards with the master maps after the course is set. They contain the descriptive clues for each control point, control code, grid coordinate references, returning time

for competitors, removal times for each location, and panic azimuth. Organizers keep the clue description cards and the master maps confidential until the competitors start the event.

SCORING

Organizers score the *cross-country* or *free event* by the competitor's time alone. Competitors must visit all control points; failure to visit one results in a disqualification. In this event, the fastest time wins. A variation that organizers often use for beginners is to have a "not-later-than" return time at the finish and to add minutes on to their final time for the number of minutes late and for the number of control points not located.

The *score* event requires the participant to collect as many points as possible within the time limit. Organizers deduct points for extra time spent on the course — usually one point for every 10 seconds over the time limit.

SAFETY

The following items and provisions are required to ensure that an orienteering course runs as safely as possible. Furthermore, the course organizer will ensure that all participants receive a detailed safety briefing that covers the key information listed below.

- *First Aid.* Ensure that a first aid kit is available at the start and finish. One of the officials should be trained in first aid, or a qualified medical person should be at the event.
- *Control points.* Locate all control points where the safety of the competitors is not endangered by hazardous terrain or other conditions.
- *Safety lane.* Designate a location, usually linear, on the course where competitors may go if injured, fatigued, or lost. A good

course will usually have a well-defined boundary as a safety lane, then competitors can set a panic azimuth on their compass and follow it until they reach the boundary.

- *Finish time.* All orienteering events must have a final return time. At this time, organizers should sound a loud siren or horn and all competitors must report to the finish line, even if they have not completed the course.
- *Search and rescue procedures.* If all competitors have not returned by the end of the competition, the officials should drive along the boundaries of the course to pick up the missing people.

Interest in orienteering within the United States has grown rapidly over the years. Orienteering is conducted under the guidelines of the United States Orienteering Federation, which presently has approximately 70 clubs affiliated with it.

CONCLUSION

Orienteering is a form of land navigation where the terms, symbols, and techniques are different from military land navigation. Although an expert military map reader/land navigator is by no means ready to complete a civilian orienteering event, military experience and training in navigating on the ground and reading maps (as well as physical training and decision-making) will help you to become a good orienteering competitor. Several orienteering practices and a complete familiarization with the map reading skills that we presented in previous lessons will help you to gradually become competitive in this exciting and challenging sport.